



PROMOTING NATIONAL SECURITY SINCE 1919

2009 INSENSITIVE MUNITIONS AND ENERGETIC MATERIALS TECHNOLOGY SYMPOSIUM

LOWER COST SOLUTIONS FOR 21ST CENTURY IM/EM REQUIREMENTS

MAY 11-14, 2009 www.ndia.org/meetings/9550 🛛 LOEWS VENTANA CANYON RESORT 🕨 TUCSON, /



TUCSON AREA INFORMATION AND LOEWS VENTANA CANYON RESORT

Things to do	Loews Ventana Canyon Resort
Hiking	
Biking	Hotel Features:
Military History Trips	Spa and Tennis Center
Horse Back Riding	Two 18-hole, Fazio-designed PGA golf courses
Rock Climbing	Two swimming pools with Jacuzzis
Astronomy	Hiking, bicycle rentals, croquet court, ping-pong, and basketball
Golf	
Historic Anza Trail	
Site See Missions and Churches	Fore more information on the Loews Ventana Canyon Resort, visit
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CONTINENTAL BREAKFAST SPONSOR (AVAILABLE TO 3 SPONSORS)......INVESTMENT: \$8,000 PER BREAKFAST

ONE SOLD TO RAYTHEON

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- EVENT SPECIFIC SIGNAGE AND THROUGHOUT CONFERENCE
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- LIGHT REFRESHMENTS FOR CONFERENCE ATTENDEES DURING BREAKS (TO INCLUDE COFFEE, TEA, SODAS AND WATER)
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- 10-SLIDE CONTINUOUS LOOP POWER POINT PRESENTATION TO BE SHOWN PRIOR TO LUNCHEON SPEAKER
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ONE SOLD TO IMEMG

MONDAY, MAY 11

- 4:30 pm 7:00 pm REGISTRATION OPENS
- 5:30 pm 7:00 pm OPENING RECEPTION

TUESDAY, MAY 12

7:00 am - 8:00 am **CONTINENTAL BREAKFAST** 8:00 am - 8:10 am WELCOME REMARKS Conference Chair : Mr. Steven Nicolich, US Army RDECOM-ARDEC 8:10 am - 8:40 am **KEYNOTE ADDRESS** Mr. Ron Carsten, Raytheon 8:40 am - 9:05 am **MSIAC AWARDS** Mr. Patrick Touzé, MSIAC 9:05 am - 9:25 am IM OVERVIEW Mr. Patrick Touzé, MSIAC 9:25 am - 9:40 am DOD ORDNANCE TECHNOLOGY CONSORTIUM Mr Matthew Bevard, OSD-ATL 9:40 am - 10:00 am ANALYSIS OF THROW DISTANCE PRODUCED BY A SUB-DETONATIVE MUNITION RESPONSE Dr. Ernest Baker, US Army RDECOM-ARDEC

10:00 am - 10:30 am BREAK

2A- IM Systems I

Session Chair: Stephen Struck, USAF-Eglin 10:30 AM Replacement of Octol with IM Explosive in SMAW HEAA Warhead Carrie Gonzalez, NSWC Indian Head Division 10:50 AM Common Low-Cost Insensitive Munitions Explosive Replacement for Comp B Philip Samuels, US Army RDECOM-ARDEC 11:10 AM 120mm IMHE-T: Effective 120mm IM Solution Jason Gaines, General Dynamics-OTS 11:30 AM Linear Demolition Charge Insensitive Munition (IM) Program Robert Hutcheson, NSWC, Indian Head Division 11:50 AM The 155mm LU211 IM, an Example of IM Implementation

Implementation Régis Aumasson, NEXTER Munitions

2B- Synthesis I

Session Chair: Andrew Sanderson, ATK 10:30 AM Synthesis and Scale Up of Sym-Triaminotrinitrobenzene (Tatb) at Holston Army Ammunition Plant and Evaluation of PBXN-7 and PBXW-14 David Price, BAE Systems OSI

- **10:50 AM** Towards The Synthesis of Organic Nanoenergetic Compositions Anne Keromnes-Wuillaume, CEA
- **11:10 AM** Process Improvement Studies for Scale-Up of HNS Jacob Morris, BAE Systems OSI
- 11:30 AM Development Toward the Large Scale Synthesis of TEX Sarah Headrick, ATK
- **11:50 AM** Comparison Between Polymerization Techniques for Synthesis of Energetic Thermoplastic Elastomers Khalifa Alkaabi, University of Stellenbosch

3B- Processing I

The Incorporation of New Refining Technologies Within the Existing Nitrocellulose Manufacturing

Process at the Radford Army Ammunition Plant

Zachary Higginbotham, Alliant TechSystems Inc.

Novel Manufacturing Process Development for the

Development And Optimization of a Production Scale Process for the Manufacture of IMX-101

Explosive at Holston Army Ammunition Plan

Manufacturing Method for IM.

High-Blast Explosive PAX-3 Brian Alexander, BAE Systems

Curtis Teague, BAE Systems OSI

Richard Wild, Diehl BGT Defence

12:10 pm - 1:40 pm SIT DOWN LUNCHEON IN GRAND BALLROOM

3A- Modeling I Session Chair: Ernie Baker, US Army RDECOM - ARDEC Session Chair: Andrew Wilson, Esterline ARMTEC Defense 1:40 PM Using a Single Phase FEM Code to Model Phase 1:40 PM Press Technology of IHE Charges. A Cost Effective Change During SCO Analysis David Hunter, General Dynamics Ordnance and Tactical Systems 2:00 PM 2:00 PM Modeling Fragmentation Performance of Insensitive **Explosive Fragmentation Munitions** Vladimir Gold, US Army RDECOM-ARDEC 2:20 PM 2:20 PM New IM Issue on Naval Platforms: Solid Rocket Motor (SRM) Pneumatic Explosion Risk. Effects Prediction Methodology. Nadège Duval, French MoD DGA/CAEPE 2:40 PM 2:40 PM Safety Assessment Of Solid Rocket Motors Nicolas Couroneau, French MoD/DGA/CAEPE

3:00 pm - 3:20 pm BREAK

	4A- Explosive Formulations I	_
Session C	hair: Paul Braithwaite, ATK	S
3:20 PM	Advances in Cast Cure Explosives	3
	Robert Hatch, ATK Launch Systems	1
3:40 PM	An Insensitive Substitute for Composition A 3 Christian Spyckerelle, EURENCO	3
4:00 PM	Development, Optimization, and Application of	
	Combined Effects Explosives	1
	Wendy Balas, US Army RDECOM-ARDEC	
4:20 PM	GUNTOL - Melt Cast for IM	4
	Per Sjoberg, Eurenco Bofors AB	
4:40 PM	Development of Insensitive Aluminized Melt-Pour Explosive	2
	Virgil Fung, BAE Systems	1

	4B- Technology Resources
Session Cl	nair: Melissa Hobbs, GD-OTS
3:20 PM	South African Navy Prioritisation of
	Ammunition for Insensitive Munitions (IM) THA and Characterisation Klaas Steyn, South African Navy
3:40 PM	SA Navy 76mm Ammunition IM Evolution From Prioritisation to Tha to Characterisation and Finally to IM Compliance
	Cedric Brijraj, Armscor
4:00 PM	DARTS & HEAT - Latest Components of The MSIAC IM Test Responses Databases Suite Pierre Archambault, MSIAC
4:20 PM	TEMPER : 2009 Development Roadmap Emmanuel Lapébie, DGA/DET/CEG
4:40 PM	Analyzing Production Processes of Energetic

Materials Using Ultrasound Technology Rajen Patel, US Army RDECOM-ARDEC

5:30 pm - 6:30 pm RECEPTION

6:30 pm

DINNER

Invited Guest Speaker: Dr. Peter Smith, University of Arizona, Phoenix Mars Mission

WEDNESDAY, MAY 13

7:00 am - 8:00 am CONTINENTAL BREAKFAST

5A- Ingredients

Session Cl	hair: Heather Gokee, NSWC- Indian Head
8:00 AM	Novel Plasticizers for IM compliant Solid Propellants
	Ana Racoveanu, Physical Sciences, Inc.
8:20 AM	FOX-7, An IM Ingredient Candidate - Where are We Today?
	Henric OEstmark, Swedish Defence Research Agency, FOI
8:40 AM	Evaluation of R8002, an Alternate Energetic Plasticizer to BDNP A/F, for use in DOD Munitions (Revised as of 3/17/09) Lilia Mastov, US Army RDECOM-ARDEC
9:00 AM	A New Generation of Binder for Cast PBX Bernard Mahe, EURENCO France
9:20 AM	Qualify an Alternate Polyisobutylene (PIB) Supplier for Composition C-4 Manufacture Brad Zastrow, US Army RDECOM-ARDEC

5B- IM Systems II

Session Chair: Brian Fuchs, US Army RDECOM-ARDEC

- 8:00 AM IM Improvements for the MK 22 Mod 4 Rocket Motor Leandro Garcia, NSWC Indian Head Division
- 8:20 AM Propellant Blast Suppressive Transportation Box (PBSTB) - a Cost Effective Way to Improve the IM-Signature of Rounds Packed in Transport Boxes Jon Toreheim, Saab Bofors Dynamics AB
- 8:40 AM Modeling and Testing of Ceramic Armor Tile Survivability to Fragment Attack Moran Shpitzer, Rafael
- **9:00 AM** IM Solutions for Projectiles Crimped to Cartridges for Artillery Application, Phase II, Transition from Cartridge Case Venting to Insensitive Propellant Carl Campagnuolo, SOCOM
- **9:20 AM** Managing the Development and Capability Investment of the IM Development Programs Through Science and Technology and Munitions Requirements Ken Tomessello, Naval Sea Systems Command

9:40 am - 10:00 am BREAK

6A- Explosive Formulations II Session Chair: Wendy Balas, US Army RDECOM- ARDEC 10:00 AM CLX 533, A New Insensitive High Explosive Eli Shachar, IMI-ISRAEL 10:20 AM Morphology and Shock Sensitivity in RDX Based Flexible PBX Chagit Denekamp, Rafael - Advanced Defense Systems Ltd. 10:40 AM Processing Studies of DNAN Based Melt-Pour Explosive Formulations Pierre Pelletier, GD-OTS Canada 11:00 AM Insensitive Enhanced Blast Formulations Philippe Chabin, Eurenco France 11:20 AM FOX-7 based Insensitive Cast PBX Christelle Collet, SNPE Materiaux Energetiques

6B- Modeling II

Session Chair: Peter Haskins, QinetiQ

10:00 AM	Modeling of Warhead Response to Projectile Impact with TEMPER Software Pierre-François Péron, MSIAC
10:20 AM	The Performance of Insensitive Blast Enhanced Explosives Werner Arnold, MBDA-TDW
10:40 AM	Institute for Multi Scale Reactive Modeling William Davis, US Army RDECOM-ARDEC
11:00 AM	Design for Insensitive Munitions Compliance of XM1069 120mm Multipurpose Tank Round David Pfau, US Army RDECOM-ARDEC
11:20 AM	Modeling Methodology for Predicting SCO Performance of the Excalibur Warhead David Hunter, General Dynamics Ordnance & Tactical Systems

11:40 am - 1:00 pm LUNCH

7A- Synthesis II

Session Chair: Per Sjoberg, Eurenco Bofors AB

- 1:00 PM Laboratory Scale Nitration of Cellulose as a Cost Effective Risk Mitigation Tool for the Production of Nitrocellulose at Radford Army Ammunition Plant Benjamin Vaughan, Alliant Tech Systems
- **1:20 PM** Synthesis and Characterisation of NNHT (2-Nitrimino-5-nitro-hexahydro-1,3,5-triazine) Eamon Colclough, QinetiQ
- 1:40 PM Synthesis and Characterization of New Energetic, Insensitive Melt-Pour Candidates David Price, BAE Systems OSI
- **2:00 PM** Characterization of Existing Stockpile and Development of Synthetic Calcium Disilicide Paul Anderson, US Army RDECOM-ARDEC
- 2:20 PM Butane Triol Synthesis and Manufacture Will Tilford, BAE Systems OSI

7B- Testing I

Session Chair: Kenneth Graham, Aerojet

- 1:00 PM Qualification Testing of the Insensitive TNT Replacement Explosive IMX-101 Kenneth Lee, US Army RDECOM-ARDEC
- 1:20 PM Qualification of ITEX-07 Explosive for Fuze Applications Rainer Schirra, DyniTEC
- **1:40 PM** Studies of HBU88B manufactured with CONUS RDX Pierre Pelletier, GD-OTS Canada
- 2:00 PM Low Velocity Impact Testing and Simulation on Generic Munitions Gert Scholtes, TNO Defence, Security and Safety
- 2:20 PM Fragment Impact Studies of Complete and Sectioned Rocket Motors Malcolm Cook, QinetiQ Ltd

2:40 pm - 3:00 pm BREAK

8A- Propellants

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3:00 PM	hair: Nora Eldredge, US Army Research Laboratory Qualitative Evaluation of Response of LOVA Gun Propellant Charge by Bullet Impact and Cook-Off Jun Maruyama, Ground Systems Research Center,GSRC, TRDI, MOD Insensitive Munitions (IM) Testing: 25mm Target Practice, Discarding Sabot with Trace (TPDS-T), M910 Cartridge using ECL Propellant Bishara Elmasri, US Army RDECOM-ARDEC
3:40 PM	Army Advanced Gun Propellant Formulations Thelma Manning, US ARMY RDECOM ARDEC
4:00 PM	A Stable Liquid Mono Propellant based on ADN Per Sjoberg, Eurenco Bofors AB
4:20 PM	Revolutionary Insensitive, Green and Healthier Training Technology with Reduced Adverse Contamination (RIGHTTRAC) Technology Demonstrator Program

Patrick Brousseau, DRDC Valcartier

8B- Technology

Session Chair: Pierre-François Péron, MSIAC

- 3:00 PM Slow Cookoff Testing of a Thermally Activated Venting System
 - Michael Fisher, Cornerstone Research Group, Inc.
- **3:20 PM** High Rate Thermal Analysis of Propellant Based Cook-Off Mitigants Duncan Langlois, ATK Energetics Systems
- **3:40 PM** Using Energetic Materials to Control Warhead Ignition During Slow Cook-Off Nausheen Al-Shehab, US Army RDECOM-ARDEC
- **4:00 PM** Metal Matrix Composite (MMC) Solid Rocket Motor Demonstration Matt Shewmaker, NAWCWD China Lake, CA
- **4:20 PM** Production of Aluminum Metal Matrix Composite Cases for Insensitive Munitions Testing Brian Gordon, Touchstone Research Laboratory

4:40 pm

ADJOURN FOR THE DAY

THURSDAY, MAY 14

7:30 am - 8:30 am CONTINENTAL BREAKFAST

9A- Testing II

	hair: Tim Mahoney, NAWC- China Lake Accelerated Ageing Study of Low Sensitivity PBX Formulation - FPX V40
8:50 AM	Mari-Ella Sairiala, PVTT
9:10 AM	IM Response for Army Engineering Charges Based on FPX V40 Hannu Hytti, OY FORCIT AB
9:30 AM	New Cost Effective Test Methods Within the IM Program Rickard Lindström, Saab Bofors Test Center AB
9:50 AM	Development of Novel Launcher for Fragment Impact Test Vincent Tanguay, Defence R&D Canada

9B- Processing II

Session Chair: Scott McDonald, US Army RDECOM-ARDEC

- 8:30 AM Temperature Independant Gun Propellants Based on NC and DNDA For IM Ammunition Dietmar Mueller, Fraunhofer Institut Chemische Technologie (ICT)
 8:50 AM Co. Submission of Cum Propellants
- 8:50 AM Co-Extrusion of Gun Propellants Martijn Zebregs, TNO Defence, Security and Safety
- 9:10 AM Foamable Celluloid Compositions for Enhanced Combustion Characteristics and Low Temperature Performance Elbert Caravaca, US Army RDECOM-ARDEC
- 9:30 AM Scaleup Of Energetic Nitrate Salts For Insensitive DEMN Formulations Sarah Headrick, ATK
- **9:50 AM** Enhanced Production Capabilities for IM Explosive Ingredients Using the Agile Manufacturing Facility at Holston Army Ammunition Plant Mike Ervin, BAE Systems

10:10 am - 10:30 am BREAK

10A- Explosive Formulation III Session Chair: Paul Wanninger, IMEMG 10:30 AM Tailored Sensitivity Explosive Formulations Bruno Nouguez, EURENCO France 10:50 AM Comp B Explosive Replacement Development Robert Hatch, ATK Launch Systems 11:10 AM Recent Developments in Composition C-4: Towards an Alternate Binder and Reduced Sensitivity James Owens, BAE Systems 11:30 AM Experimental Deviations from Conventional Critical Temperature Models for Non-ideal Explosive Formulations Brian Roos, U.S. Army Research Laboratory

10B- IM/EM Issues

Session Chair: Matt Beyard, OSD- ATL

- **10:30 AM** Pyrotechnic Mixture Substition for Explosives Randall Busky, ATK Armament Systems Lake City
- 10:50 AM Thermal Analysis of IMX-101 Through Large Scale Slow Cook Off Testing Alberto Carrillo, BAE Systems OSI
- **11:10 AM** IM Response Descriptors an Update for Assessment Processes Thomas Swierk, NSWC Dahlgren
- 11:30 AM FITS, Finnish IM Technology Study Kosti Nevala, Patria Land & Armament

11:50 am - 12:00 pm CLOSING REMARKS

1:00 pm

GOLF OUTING

ING *MUST PRE- REGISTER FIRST AS THERE ARE LIMITED SPOTS AVAILABLE

GOLF OUTING

IMEM Golf Tournament - May 14, 2009 1:00 pm

Ventana Canyon Golf Course
Price per golfer \$100.00 • Only 48 slots available

(Price includes green fees, cart, prizes and awards reception) Rental clubs are available for \$60.50

Send Checks and Registration Form To: Attn: Karen Stasell, GD-OTS (make checks payable to GD-OTS) 11399 16th Ct, Suite 200 St. Petersburg, FL 33716 (ph)727-432-0809 kstasell@gd-ots.com

lame:				
Rental Clubs (\$60.50)	: Left handed	Right handed	d	
Foursome:				
Player:2	Renta	al Clubs: Left h	anded	Right handed
Player:3	Renta	al Clubs: Left h	anded	Right handed
Player:4	Renta	al Clubs: Left h	anded	Right handed
Company:		_		
Address:				
City:	State:	Zip:	_	
Telephone:	Fax:		Email:	
Price per golfer (\$100) Rental Clubs (\$	\$60.50 per set) Total an	nount due:
\$				

REGISTRATION

ONLINE:

Our preferred method of registration is online. Visit http:// www.ndia.org/meetings/9550 to register today.

FAX:

Register via fax by completing the Registration Form and faxing it to (703) 522-1885. Please do not fax any registrations after April 27, 2009.

HOTEL INFORMATION

A limited number of rooms have been reserved at The Loews Ventana Canyon Resort, Tucson AZ. To make a reservation, call 1-800-234-5117 and ask for the "National Defense Industrial Association IM/EM" conference room block. The cutoff date for accepting reservation into this block is April 17, 2009, but rooms may sell out before then.

TRANSPORTATION

The hotel is not located near the airport. Taxi rides cost approximately \$60, and allow up to 4 passangers to split the cost. It is recommended to share rides. Taxi stands are located right outside the airport, as well as shuttles and vans.

CONFERENCE REGISTRATION FEES	EARLY (BEFORE 4/11)	REGULAR	LATE (AFTER 5/1)
GOVERNMENT/ ACADEMIA/ ALLIED GOV.	\$535	\$590	\$650
INDUSTRY NDIA MEMBER	\$740	\$815	\$895
INDUSTRY Non-Ndia member	\$785	\$865	\$950
SPEAKER	\$535	\$590	\$650

MAIL:

Registration forms may be mailed to: NDIA, Event #9380, 2111 Wilson Blvd., Suite 400, Arlington, VA 22201. Please do not mail any registrations after April 27, 2009. Registrations will not be taken over the phone. Payment must be made at the time of registration.

ATTENDEE ROSTER

An attendance roster will be distributed at the conference. Your registration form and payment must be received April 27, 2009 to be included in the roster. An updated roster will NOT be printed after the conference.

CANCELLATION POLICY

Cancellations before 4/11/09 receive a full refund. Cancellations between 4/11/09-4/30/09 receive a refund minus a \$75 cancellation fee. No refunds for cancellations received on/after 5/1/09. Cancellations must be made in writing. Substitutions welcome in lieu of cancellations. Please e-mail your cancellations or substitutions to Jennifer Hoechst via email: jhoechst@ndia.org

CONFERENCE ATTIRE

The appropriate attire for this conference is business casual attire or Military Class B uniform.

SPECIAL NEEDS

NDIA is supports the Americans with Disabilities Act of 1990. Attendees with Special Needs should contact Jennifer Hoechst by March 10, 2009 via email: jhoechst@ndia.org d refer to the Insensitive Munitions and Energetic Materials Conference.

INQUIRIES:

For more information, contact Jennifer Hoechst, Meeting Planner, NDIA, at 703-247-2568 or via e-mail at jhoechst@ndia.org and refer to the Insensitive Munitions and Energetic Materials Conference.

TUCSON AREA: THINGS TO DO

For more information on the Tucson area, things to do and possible spouse outings, visit http://www.visittucson.org/

EVENT #9550 ► NDIA REGISTRATION FORM

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INSENSITIVE MUNITIONS AND ENERGETIC MATERIALS ► LOEWS VENTANA CANYON RESORT TUCSON, AZ ► MAY 11-14, 2009

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Government/Academia ¹ Industry NDIA Member and	\$535 \$5	90 \$650		r the free government membership.
affiliates (AFEI, NTSA, PSA, WID)	\$740 \$8	15 \$895	² Registration fees for no	n-NDIA (or affiliate) members
Industry non-NDIA member ²	\$785 \$8		include a one-year non-i	refundable NDIA membership
Speaker No refunds for cancellations rece Substitutions welcome in lieu		Э.	—\$15.00 will be applied subscription to National I	
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National Defense Industrial Association

BY COMPLETING THE FOLLOWING, YOU HELP US UNDERSTAND WHO IS ATTENDING OUR EVENTS.

PRIMARY OCCUPATIONAL

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- ▷ Navy
- > Air Force
- Marine Corps
- ▷ Coast Guard
- > DOD/MOD Civilian
- ▷ Government Civilian
- (Non-DOD/MOD)
- > Trade/Professional Assn.
- Educator/Academia
- Professional Services
- Non-Defense Business
- Other ____

CURRENT JOB/TITLE/POSITION.

Check ONE.

- Senior Executive
- ▷ Executive
- > Manager
- Engineer/Scientist
- > Professor/Instructor/Librarian
- > Ambassador/Attaché
- ▷ Legislator/Legislative Aide
- > General/Admiral
- Colonel/Navy Captain
- Lieutenant Colonel/Commander/ Major/Lieutenant Commander
- Captain/Lieutenant/Ensign
- Enlisted Military
- Other ____

Year of birth _____

QUESTIONS, CONTACT:

JENNIFER HOECHST, MEETING PLANNER

PHONE: (703) 247-2568

E-MAIL: JHOECHST@NDIA.ORG

MAIL REGISTRATION TO:

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> TO REGISTER, VISIT: www.ndia.org/meetings/9550



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